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जलीय तरल शक्ति—शीघ्रकार्य—युग्मक

भाग 1 आयाम और अपेक्षायें

Indian Standard

HYDRAULIC FLUID POWER — QUICK ACTION COUPLINGS

PART 1 DIMENSIONS AND REQUIREMENTS

ICS 75 : 120

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110 002

October 1995

Price Group 3

Fluid Power Fittings, Hoses and Hose Assemblies Sectional Committee, PE 17

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 7241-1 : 1987 'Hydraulic fluid power — Quick action couplings — Part 1 : Dimensions and requirements', issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendations of Fluid Power Fittings, Hoses and Hose Assemblies Sectional Committee and approval of the Production Engineering Division Council.

The text of the ISO standard has been approved as suitable for publication as Indian Standard without deviation. Certain conventions are however not identical to those used in Indian Standard. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker in the International Standard while in Indian Standards, the current practice is to use point (.) as the decimal marker.

In the adopted standard reference appears to certain International standards for which Indian Standards also exist. The corresponding Indian standards which are to be substituted in their respective places are listed below along with their degree of correspondence for the editions indicated:

International Standards	*Indian Standards*	*Degree of Correspondence*
ISO 2944 Fluid power systems and components—Nominal pressures	IS 5107 : 1969 Recommendations on nominal pressures for oil-hydraulic system elements	Technically equivalent
ISO 5598 Fluid power systems and components—Vocabulary	IS 10416 : 1992 Fluid power systems and components—Vocabulary	Identical
ISO 5675 Agricultural tractors and machinery—Hydraulic couplers for general purposes—Specifications	IS 12364 : 1992 Agricultural tractors and machinery—General purpose—Quick action hydraulic couplers (*first revision*)	Technically equivalent
ISO 7241-2 Hydraulic fluid power—Quick-action couplings—Part 2 : Test methods	IS 13614 (Part 2) : 1993 Hydraulic fluid power—Quick action couplings: Part 2 Test methods	Identical

The concerned technical committee has reviewed, the provisions of ISO 4397 'Fluid power systems and components—Connectors and associated components—Nominal outside diameters of tubes and inside diameters of hoses' and has decided that they are acceptable for use in conjunction with this standard.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value observed or calculated, expressing the result of a test or analysis,shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

HYDRAULIC FLUID POWER — QUICK ACTION COUPLINGS

PART 1 DIMENSIONS AND REQUIREMENTS

Part 1 :
Dimensions and requirements

0 Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Quick-action couplings are used to join or separate quickly fluid conducting lines, without the use of tools or special devices.

1 Scope and field of application

This part of ISO 7241 lays down the interface dimensions and specifies basic performance requirements for two series of general-purpose hydraulic quick-action couplings. Both series are in widespread use and have similar technological advantages. The distinction in usage is mainly geographical. Series "A" is used predominantly in Europe and series "B" is predominant in America.

2 References

ISO 2944, *Fluid power systems and components — Nominal pressures*.

ISO 4397, *Fluid power systems and components — Connectors and associated components — Outside diameters of tubes and inside diameters of hoses*.

ISO 5598, *Fluid power systems and components — Vocabulary*.

ISO 5675, *Agricultural tractors and machinery — Hydraulic couplers for general purposes — Specifications*.

ISO 7241-2, *Hydraulic fluid power — Quick-action couplings — Part 2: Test methods*.

3 Definitions

For the purposes of this part of ISO 7241, the definitions given in ISO 5598 apply.

4 Dimensional requirements

4.1 Series "A" dimensional requirements are shown in figure 1 and given in table 1.

4.2 Series "B" dimensional requirements are shown in figures 2 and 3, and given in tables 2 and 3.

5 Performance requirements

5.1 Pressure rating requirements are given in table 4.

5.2 Recommended maximum internal pressure for connecting the coupling by hand is given in table 5.

6 Summary of information to be supplied

The quick-action coupling "series" and coupling "size" shall be stated when applying this part of ISO 7241 to a particular use.

7 Identification statement (Reference to this International Standard)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 7241:

"Dimensional and pressure requirements conform to ISO 7241-1[1], *Hydraulic fluid power — Quick-action couplings — Part 1: Dimensions and requirements.*"

---

[1] Specify "A" or "B".

Surface roughness values in micrometres

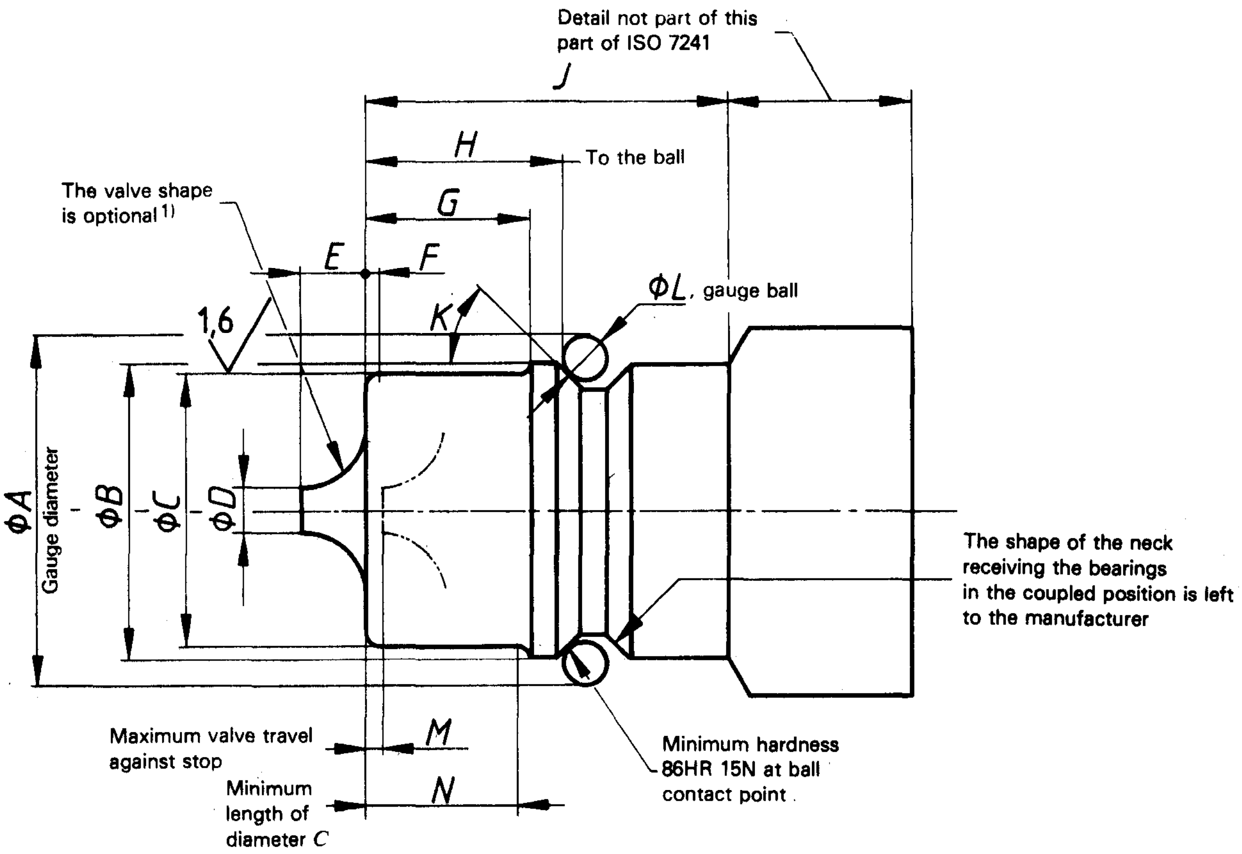
Detail not part of this part of ISO 7241
J
H
To the ball
The valve shape is optional 1)
G
E
F
ϕL, gauge ball
1,6
K
ϕA
Gauge diameter
ϕB
ϕC
ϕD
The shape of the neck receiving the bearings in the coupled position is left to the manufacturer
Maximum valve travel against stop
M
Minimum length of diameter C
N
Minimum hardness 86HR 15N at ball contact point

Figure 1 — Dimensional requirements, series "A"

Table 1 — Dimensional requirements, series "A"

Dimensions in millimetres

Size 2)	Gauge diameter *A*	*B*	*C*	*D* min. 1)	*E* max.	*F* 3)	*G*	*H*	*J* min.	*K*	*L* ± 0,002 5	*M* max.	*N* min.	Maximum valve open force 4)
6,3	18,7	12,9 13	11,73 11,86	1,9	1,8	0,7 1,5	5,5 5,7	6,6 6,8	14,5	44° 46°	3,968	0,5	3,7	—
10	24,1	18,3 18,4	17,2 17,3	3	3,8	0,7 1,5	8,8 9	9,9 10	18	44° 46°	3,968	0,5	7	—
12,5	30,3	23,66 23,74	20,48 20,56	4,5	4	0,7 1,5	9,2 9,4	11,6 11,8	24	44° 46°	4,762	0,5	8	45 N
20	37,1	30,4 30,5	29 29,1	5,4	7,2	1 2,5	15,9 16,1	17,5 17,7	27,5	44° 46°	4,762	0,6	13,7	—
25	43,0	36,5 36,6	34,21 34,34	7,8	8,5	1,5 3	19,7 20	22,8 23	34	44° 46°	4,762	0,7	16,3	—
31,5	56,0	47,7 47,8	44,9 45	8,9	11	2 4,5	24,9 25,1	28,4 28,6	43	44° 46°	6	0,7	24	—
40	68,5	57,5 57,6	54,9 55	9,9	13	3 6	30,6 30,8	33,7 33,9	51	44° 46°	8	0,8	29,6	—
50	83,7	69,9 70	65 65,1	9,9	16,6	3 7	35 35,2	39,6 39,8	61	44° 46°	10	0,8	34	—

1) Use dimension *D* except if the valve has a spherical form.

2) The size designation corresponds to the nominal inside diameter of the hose recommended for use with the coupling, see ISO 4397.

3) Radius or chamfer length. Radius with chamfer is optional.

4) Valve open force is the maximum force required to open fully the valve with zero internal pressure. The value for the 12,5 size is in accordance with ISO 5675 for agricultural tractors and machinery, and is the only value which has been defined up till now.

Surface roughness value in micrometres

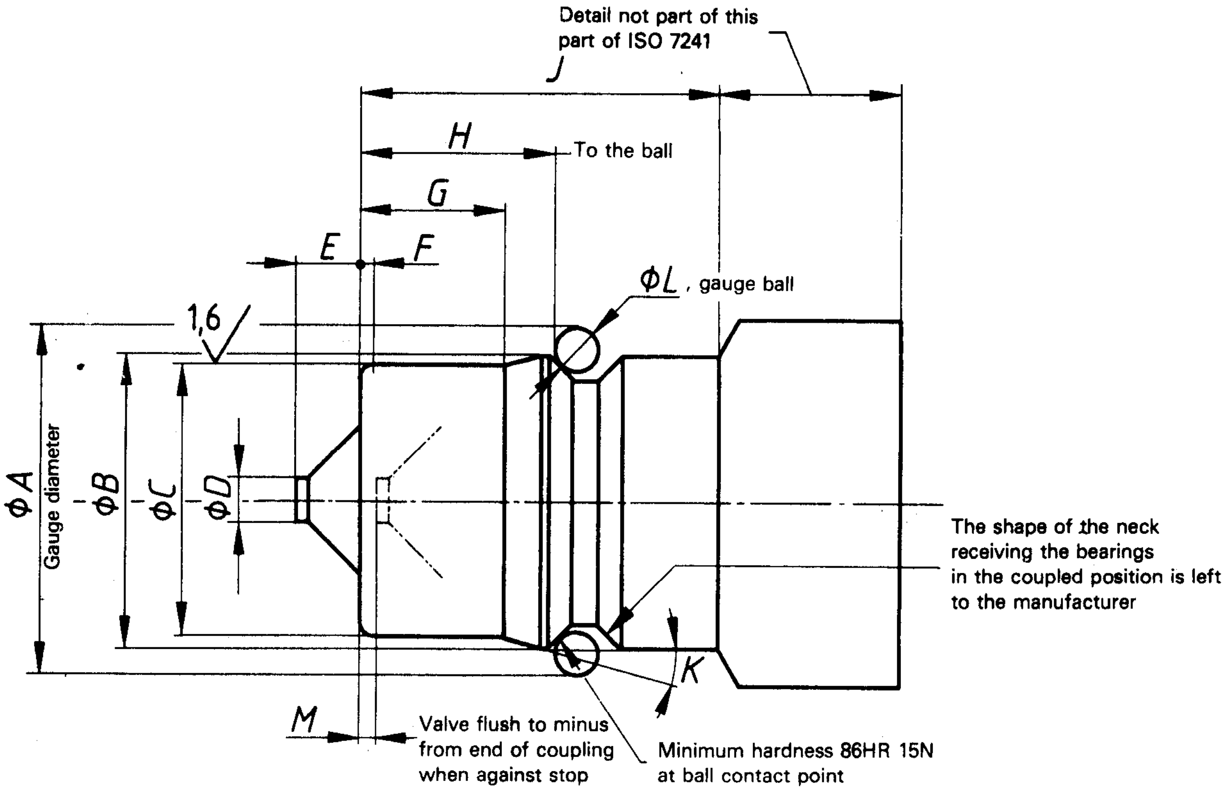
Detail not part of this part of ISO 7241
J
H
To the ball
G
E
F
ΦL, gauge ball
1,6
ΦA
Gauge diameter
ΦB
ΦC
ΦD
The shape of the neck receiving the bearings in the coupled position is left to the manufacturer
K
M
Valve flush to minus from end of coupling when against stop
Minimum hardness 86HR 15N at ball contact point

Figure 2 — Dimensional requirements, series "B" — Sizes 5 to 25

Table 2 — Dimensional requirements, series "B" — Sizes 5 to 25

Dimensions in millimetres

Size 1)	**Gauge diameter** *A*	*B*	*C*	*D* min.	*E* max.	*F* 2)	*G* min.	*H*	*J* min.	*K* max.	*L* ± 0,002 5	*M* max.
5	16,69	12,09 12,19	10,8 10,9	2,16	2,79	0,64 1,32	7,87	11,28 11,48	18,92	16°	3,175	1,02
6,3	21,21	15,6 15,7	14,1 14,2	2,54	4,06	1,07 1,73	9,65	13,41 13,61	22,1	16°	3,967	1,02
10	26,87	20,04 20,14	19 19,1	3,05	4,83	1,07 1,73	12,45	15,52 15,72	24,89	16°	4,763	1,02
12,5	33,45	25,65 25,76	23,44 23,55	4,57	5,08	1,07 1,73	12,19	17,17 17,37	27,94	16°	5,555	1,02
20	41,66	32,66 32,77	31,34 31,45	5,08	7,37	1,45 2,51	18,8	22,86 23,06	35,56	16°	6,35	1,02
25	49,38	40,46 40,56	37,69 37,8	6,1	8,64	1,45 2,51	20,57	27,36 27,56	40,39	16°	6,35	1,02

1) The size designation corresponds to the nominal inside diameter of the hose recommended for use with the coupling, see ISO 4397.

2) Radius or chamfer length. Radius with chamfer is optional.

Surface roughness value in micrometres

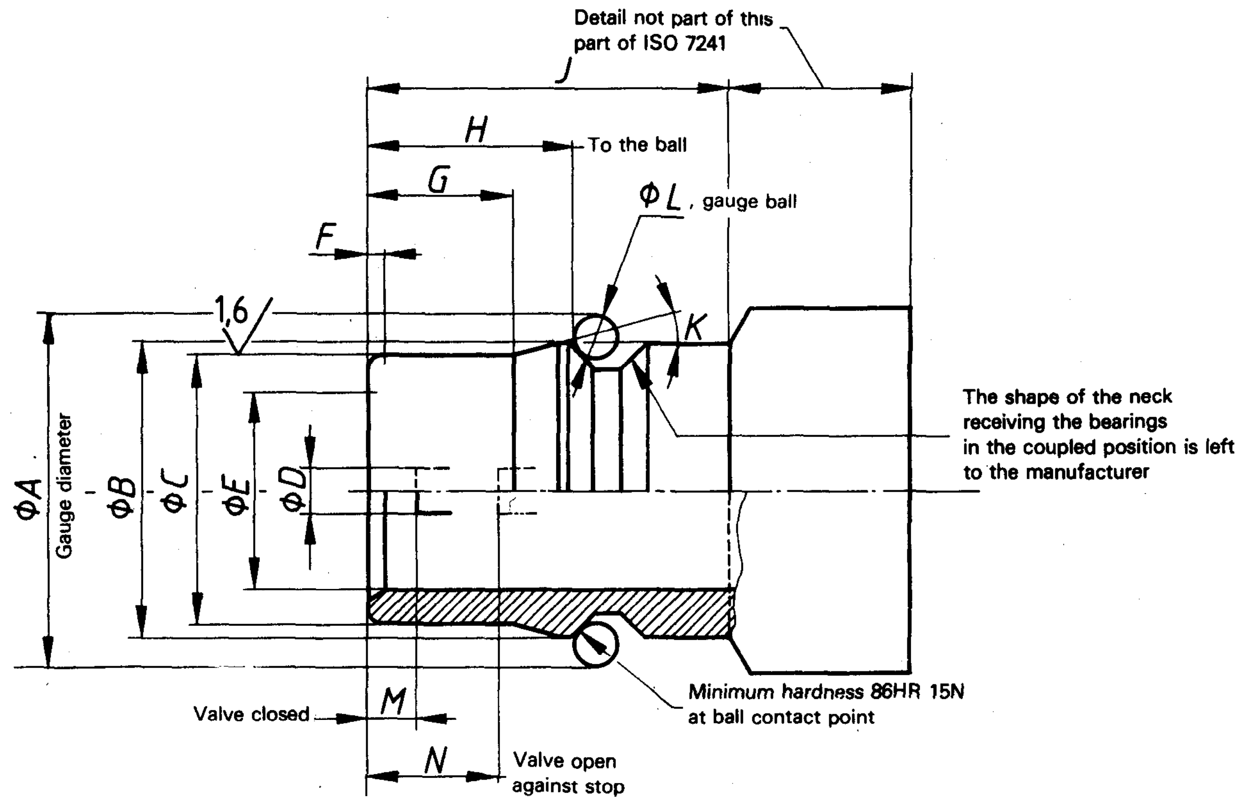
Detail not part of this part of ISO 7241
J
H
To the ball
G
ΦL, gauge ball
F
1,6
K
The shape of the neck receiving the bearings in the coupled position is left to the manufacturer
ΦA
Gauge diameter
ΦB
ΦC
ΦE
ΦD
Minimum hardness 86HR 15N at ball contact point
Valve closed
M
N
Valve open against stop

Figure 3 — Dimensional requirements, series "B" — Sizes 40 and 50

Table 3 — Dimensional requirements, series "B" — Sizes 40 and 50

Dimensions in millimetres

Size 1)	Gauge diameter *A*	*B*	*C*	*D* min.	*E*	*F* 2)	*G* min.	*H*	*J* min.	*K* max.	*L* ±0,002 5	*M* max.	*N*
40	59,13	47,96 48,06	44,4 44,5	8,89	38,05 38,15	1,4 2,54	32,56	38,91 39,17	53,34	21°	7,938	10	26,36 26,87
50	85,6	66,55 66,68	63,14 63,27	10,16	53 53,16	1,4 2,54	38,1	45,16 45,42	65,02	21°	12,7	15	32 32,51

1) The size designation corresponds to the nominal inside diameter of the hose recommended for use with the coupling, see ISO 4397.

2) Radius or chamfer length. Radius with chamfer is optional.

Table 4 — Pressure rating 1)

Coupling size 2)	Series "A"		Series "B"	
	Maximum operating pressure 3) bar (MPa) 4)	Minimum burst pressure 5) bar (MPa)	Maximum operating pressure bar (MPa)	Minimum burst pressure bar (MPa)
5	— 6)	— 6)	250 (25)	1 000 (100)
6,3	315 (31,5)	1 260 (126)	250 (25)	1 000 (100)
10	315 (31,5)	1 260 (126)	250 (25)	1 000 (100)
12,5	250 (25)	1 000 (100)	250 (25)	1 000 (100)
20	250 (25)	1 000 (100)	160 (16)	640 (64)
25	200 (20)	800 (80)	100 (10)	400 (40)
31,5	200 (20)	800 (80)	— 6)	— 6)
40	160 (16)	640 (64)	63 (6,3)	250 (25)
50	100 (10)	400 (40)	50 (5)	200 (20)

1) See ISO 2944.

2) *The size designation corresponds to the nominal inside diameter of the hose recommended for use with the coupling,* see ISO 4397.

3) Verify maximum operating pressure by pressure impulse testing in accordance with ISO 7241-2 for 100 000 cycles.

4) 1 bar = 100 kPa = 10^5 Pa = 0,1 MPa; 1 Pa = 1 N/m^2

5) Verify minimum burst pressure by burst pressure testing in accordance with ISO 7241-2 in the coupled and uncoupled conditions.

6) Not included in this range.

Table 5 — Recommended maximum internal pressure for connecting by hand 1)

Coupling size 2)	Series "A"	Series "B"
	Internal pressure bar (kPa)	Internal pressure bar (kPa)
5	— 3)	10 (1 000)
6,3	10 (1 000)	10 (1 000)
10	10 (1 000)	6,3 (630)
12,5	6,3 (630)	5 (500)
20	3,15 (315)	2,5 (250)
25	2,5 (250)	2 (200)
31,5	1,25 (125)	— 3)
40	0,63 (63)	1,25 (125)
50	0,5 (50)	0,5 (50)

1) See ISO 2944.

2) The size designation corresponds to the nominal inside diameter of the hose recommended for use with the coupling, see ISO 4397.

3) Not included in this range.

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